

and a careful reading of the paper emphasizes this fact. Conclusions must therefore be drawn with considerable care.—CHARLES A. SHULL.

**Insects and plant diseases.**—Although both botanists and entomologists have realized for a long time that insects are carriers of organisms of plant diseases, very little attention has been given to the study of the subject. However, there is now a tendency to take up this line of investigation. Four papers have come to the reviewer's desk recently.

A paper by RAND<sup>4</sup> on the dissemination of the bacterial wilt of cucurbits follows out a suggestion given by ERWIN F. SMITH and produces evidence indicating that this leaf-eating cucumber beetle (*Diabrotica vittata*) is both the summer and the winter carrier of the *Bacillus tracheiphilus* which causes the wilt of cucumbers and other cucurbits.

In a later paper by RAND and ENLows,<sup>5</sup> the authors not only confirm the conclusions given by RAND in the first paper, but also include the 12-spotted cucumber beetle (*D. duodecimpunctata*) as an important summer carrier of this organism. In experiments by the same authors, the squash bug (*Anasa tristis*), the flea beetle (*Crepidodera cucumeris*), the melon aphid (*Aphis gossypii*), and the 12-spotted lady beetle (*Epilachna borealis*) did not transmit the disease.

Another paper by HYSLOP<sup>6</sup> on *Triphleps insidiosus* and corn rots gives conclusive evidence that this insect is the carrier of the fungi causing ear rots. In view of the fact that this insect has been considered beneficial since about 1881, HYSLOP'S studies are of more than ordinary interest.

A fourth paper by STEWART and LEONARD<sup>7</sup> records their results with a number of experiments and comes to the conclusion "that all of the sucking bugs found in the nursery are of more or less importance in producing fire blight infections and must be considered *tout ensemble*. The relative importance of each species is difficult to determine. By virtue of their method of feeding and prevalence during each season, certain species are undoubtedly more destructive than others. On the other hand, under special conditions when a certain species is found in large numbers it may become of considerable importance. Usually the tarnished plant bug is more injurious than the leaf-hopper from the fact that the greater percentage of leaf-hopper punctures occur in the leaf tissue."—MEL T. COOK.

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<sup>4</sup> RAND, F. V., Dissemination of bacterial wilt of cucurbits. Jour. Agric. Research 5:257-260. 1915.

<sup>5</sup> RAND, F. V., and ENLows, ELLA, M., Transmission and control of bacterial wilts of cucurbits. Jour. Agric. Research 6:417-434. 1916.

<sup>6</sup> HYSLOP, J. A., *Triphleps insidiosus* as the probable transmitter of corn ear rot (*Diplodia* sp. *Fusarium*). Jour. Econ. Entomology 9:435-437. 1916.

<sup>7</sup> STEWART, V. B., and LEONARD, M. D., Further studies on the rôle of insects in the dissemination of fire blight bacteria. Phytopath. 6:152-158. 1916.